

wherein the first, second, and third cyclic shifts are determined based on first, second, and third cyclic shift values respectively,

wherein the first and second cyclic shift values are separated from each other by a maximum separation value, which is determined based on a total number of cyclic shifts, and

wherein the third cyclic shift value is determined by increasing cyclically by a median separation value between the first and second cyclic shift values.

2. The method of claim 1, wherein the first, second and third cyclic shift values are a part of cyclic shift values used for transmission of DMRS sequences using four layers.

3. The method of claim 1, wherein the first, second and third cyclic shift values are indicated by a cyclic shift field in downlink control information (DCI) received via a physical downlink control channel (PDCCH).

4. The method of claim 3, wherein the first, second, and third cyclic shift values are represented by the below table:

Z	$n_{DMRS, \lambda}^{(2)}$		
	$\lambda = 0$	$\lambda = 1$	$\lambda = 2$
000	0	6	3
001	6	0	9
010	3	9	6
011	4	10	7
100	2	8	5
101	8	2	11
110	10	4	1
111	9	3	0,

wherein Z is the cyclic shift field in the DCI received via the PDCCH.

5. The method of claim 1, wherein the total number of cyclic shifts is 12.

6. The method of claim 1, wherein the maximum separation value is 6.

7. The method of claim 1, wherein the median separation value is 3.

8. A user equipment (UE) in a wireless communication system, the UE comprising:

a radio frequency (RF) unit; and

a processor, coupled to the RF unit, that:

generates first, second, and third DMRS sequences, which are associated with first, second, and third layers

respectively, by applying first, second, and third cyclic shifts to the first, second, and third DMRS sequences respectively; and

controls the RF unit to transmit the first, second, and third DMRS sequences to a base station,

wherein the first, second, and third cyclic shifts are determined based on first, second, and third cyclic shift values respectively,

wherein the first and second cyclic shift values are separated from each other by a maximum separation value, which is determined based on a total number of cyclic shifts, and

wherein the third cyclic shift value is determined by increasing cyclically by a median separation value between the first and second cyclic shift values.

9. The UE of claim 8, wherein the first, second and third cyclic shift values are a part of cyclic shift values used for transmission of DMRS sequences using four layers.

10. The UE of claim 8, wherein the first, second and third cyclic shift values are indicated by a cyclic shift field in downlink control information (DCI) received via a physical downlink control channel (PDCCH).

11. The UE of claim 10, wherein the first, second, and third cyclic shift values are represented by the below table:

Z	$n_{DMRS, \lambda}^{(2)}$		
	$\lambda = 0$	$\lambda = 1$	$\lambda = 2$
000	0	6	3
001	6	0	9
010	3	9	6
011	4	10	7
100	2	8	5
101	8	2	11
110	10	4	1
111	9	3	0,

wherein Z is the cyclic shift field in the DCI received via the PDCCH.

12. The UE of claim 8, wherein the total number of cyclic shifts is 12.

13. The UE of claim 8, wherein the maximum separation value is 6.

14. The UE of claim 8, wherein the median separation value is 3.

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